
Integrating Wireless Numbers into DA Databases: An Examination of the Regulatory, Technical, and Financial Implications

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Abstract: Directory assistance and the availability of subscriber numbers have been central to the common functionality of telephone networks. Throughout the last decade, the telecom industry has experienced a substantial movement towards wireless service, and consequently directory databases have suffered a large outflow of directory listings. This paper examines the legal, technical and market hurdles, as well as market impact, of adding wireless numbers to DA databases. Additionally, the paper takes an introspective look at the declining state of directory service in the United States with the introduction of competitive local carriers and consumer privacy concerns.

Introduction & Background

The Telecommunications Act of 1996¹ (the “Act”) and ensuing orders by the Federal Communications Commission (“FCC”), introduced not only major changes in dial-tone competition, but in administration of directory services. In passing the Act, the 104th Congress initiated the largest overhaul of telecom law in 62 years². In the 1996 Act, Congress introduced an important section, 222(e), which required local exchange carriers to provide subscriber information for directory publishing. The FCC subsequently issued a series of rules addressing and redressing concerns of telecom carriers and directory assistance providers covering topics ranging from competition in the marketplace to data interexchange. However, the FCC limited its rulings and interventions to ILECS³ and CLECS³, and never addressed the issue of CMRS³ providers. This restraint has left wireless numbers within the United States, to this day, unpublished and unavailable in any DA database – despite record subscriber growth.

Since the introduction of wireless telephony, a paradigm shift has occurred in end-user primary lines. There are two measures that can lead to a quantitative understanding of wireless service in the United States: active number assignments and active telephone loops. Carrier data as of June, 2003 indicates that Cellular/PCS providers have assigned a total of about 151,861,000 telephone numbers to subscribers.⁴ ILEC and CLEC

¹ 47 USC §151 through 47 USC §615(b)

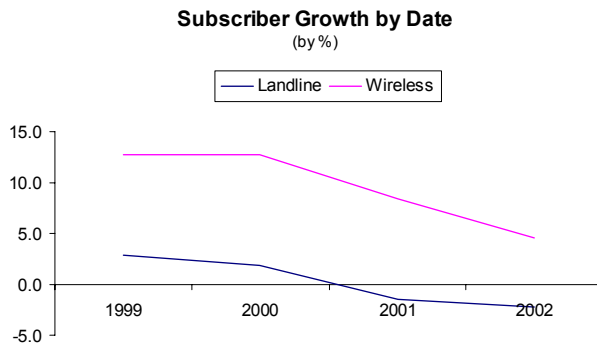
² The Communications Act of 1934 was the prior act of Congress which was replaced in its entirety by the Telecommunications Act of 1996. Prior to the passing of 1996 Act, Congress had merely patched the 1934 Act to accommodate industry demands.

³ Incumbent Local Exchange Carrier / Competitive Local Exchange Carrier / Commercial Mobile Radio Service Provider (Wireless Telephone Provider)

⁴ Table 1, Number Utilization by Carrier Type as of June 30, 2003, Page 12, *Number Resource Utilization in the United States as of June 30, 2003*.

providers reported an active number base of 335,165,000 landline assignments.⁵ Despite the disparity in number assignments, landline providers service only 187,508,000 physical loops.⁶ Wireless, therefore, makes up roughly 24% of all telephone numbers and nearly 45% of all telephone lines.

The history of wireless growth, and shrinkage of landline, is also very telling. For the fifteen year period ending 2002, ILECS have seen average subscriber line growth at 2.6 percent per annum, compared with wireless subscriber base increasing at nearly fifty

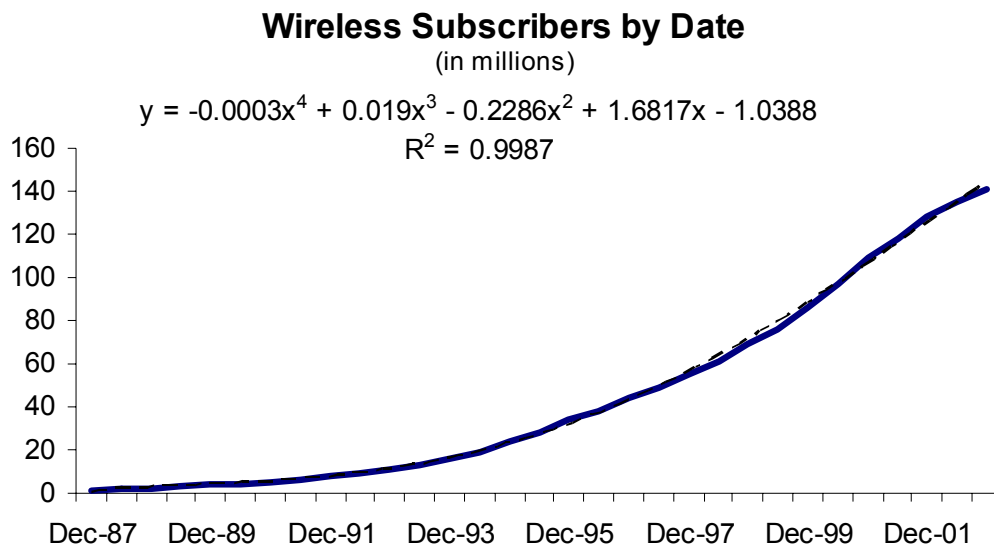


percent per annum during the same period. Using a linear relationship between time and aggregate landline subscribers, the industry should expect shrinkage of approximately 4.4% during 2004.

While economic conditions and the introduction of broadband services do substantially impact the number of fixed lines, a trend towards cellular service is arguably a

leading cause for falling subscribers. This is primarily due to a decreasing cost of mobile service, increased service levels, usability, and portability.

CTIA industry reports claimed about 92 thousand wireless subscribers in December, 1984; by 2002 the industry association reported nearly 140.7 million subscribers.⁷ This is a 1500-fold increase in the number of subscribers over an 18-year period, an average growth rate of about 50% per annum; nevertheless, subscriber increases for wireless is not linear in nature, and recent years have seen slower growth.

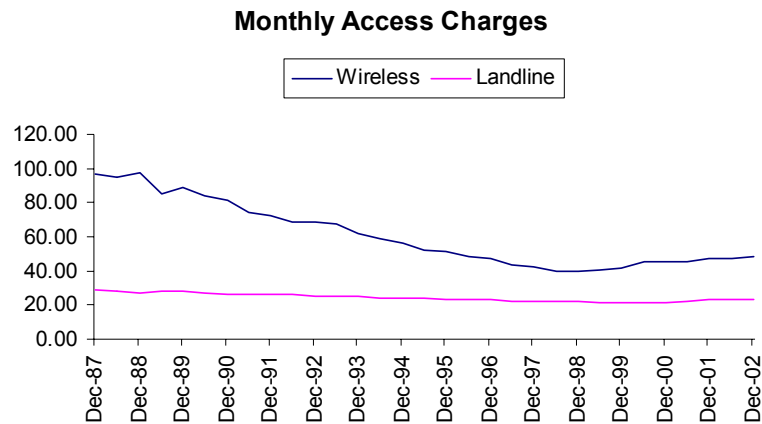


⁵ Table 1, Number Utilization by Carrier Type as of June 30, 2003, Page 12, *Number Resource Utilization in the United States as of June 30, 2003*.

⁶ Table 7.3, Telephone Loops of Incumbent Local Exchange Carriers by State, *Trends in Telephone Service*, Industry Analysis and Technology Division of the Wireline Competition Bureau, Federal Communication Commission, August 2003.

⁷ CTIA, as cited in *Trends in Telephone Service*, Wireline Competition Bureau, August 2003.

One central reason for conversion and overall subscriber base increases, can be attributed to cost decreases averaging about 5% per annum since 1987 (however, since 1999 the industry has seen upward pressure on monthly recurring charges, possible linked to investment in new technology such as G3 and industry mergers.) While the data for 2003 is not yet available, a reasonable prediction would be a 1% increase in service charges (compared with 2% for 2002, 4% 2001, 8% 2000), and continual double-declining increases.



There is still a certain amount of utility and cost benefit to landline service, and hence wireless has not, and for a long while will not, replace local dial tone altogether. Nevertheless, the affordability of wireless service has contributed to the growing number of conversions from fixed wire telephone service.

The Financial Impact (of Adding Mobile Subscriber Information)

With respect to local exchange carriers, Directory Assistance is regulated as a component of the entire service offering. Such regulation prohibits the enhanced services offered by DA providers in unregulated markets, such as wake-up calls, movie times, and restaurant reservations. The inability to charge a premium for these services, coupled with other (free) directories such as the internet, have local providers with rapidly declining revenues from DA operations and record-low call volumes. Adding wireless numbers to DA databases would not only benefit the consumer, but also help reverse the downturn in the directory assistance market.

Despite the continued growth of the wireless customer base and ever increasing dominance of wireless numbers, the United States is yet to adopt a policy requiring carriers to aggregate customer information for directory purposes in parallel to the §222(e) requirement for local exchange providers. Even if they did begin to consider requiring directory publishing, many technical and financial obstacles must first be overcome – from the inherent design of the wireless billing modules, developing procedures for delisting and data exchange.

In 2001, the total DA volume was approximately 2.960 billion calls, a 10.2% decline from the 3.296 billion calls in 2000.⁸ An additional 800 million calls for directory-assistance were placed from mobile phones, and web services provided a total of 1.326 billion listings during 2001.^{9,10} The timing for adding mobile subscriber information into

⁸ Page 29, Table 4: Major ILEC Retail and Wholesale DA Volumes Have Been Declining, *Competition and Regulation for Directory Assistance Services*, New England Economic Associates, Inc. (Taylor, et al.), 2002.

⁹ *Ibid.*, p. 17

¹⁰ *Ibid.*, p. 23

DA databases is fully appropriate, if not already too late. The introduction of competitive directory providers, including low-cost web based tools and CD-ROMS, have lead to the erosion of the traditional marketplace. Call volume for ILECS has dropped from over 5 billion in 1996 to less than 3 billion today.¹¹ The industry continues to feel downward pressure, shredding about 10% of total volume every year.

Directory Assistance Drives Network Traffic

The FCC estimates total switched telephone usage for 2001 at 4,819 billion minutes.¹² Assuming an average call length of five minutes, a rough total of 963 billion calls were placed. New England Economic Associates estimates that, when counting all directory inquires sources, approximately 13.8 billion look-ups were made in 2001, with about 2.9 billion coming directly from 411.^{13,14} Therefore, simple math provides that directory services are directly responsible for about 0.5% to 1.3% of all calls.¹⁵ Because wireless numbers are generally less available than landline numbers, it would not be unreasonable to conclude that adding mobile subscriber information to DA databases would drive a 5% increase in mobile telephone traffic, or about 36 billion minutes per year of calling.¹⁶ At a conservative rate of \$0.11 per minute, mobile subscriber information availability would provide cellular carriers with an estimated \$3.96 billion per year.

Complementing the revenue generated by increased network traffic, additional income would be derived for every call processed. It would not be unreasonable to expect mobile subscriber information to generate an additional 2 billion DA calls during the year. This alone should add between \$1 and \$2 billion to the annual directory assistance market.

Technical Feasibility (of Integrating Wireless)

Unlike traditional landline telephone switches, which are designed for, and have a protocol to communicate directory information, wireless providers have little to work from. Additionally, wireless has a high turn-over rate in wireless makes managing any database that is build extraordinarily difficult. Annual churn between carriers is estimated roughly at 30 million per year.¹⁷ This results in about 60 million database entries and deletions, or about 165,000 per day directly from churn. Changes to the database from address changes (or name/number changes) could easily reach the same level, bringing total daily updates to over three hundred thousand. However, prior to even broaching data updates, a comprehensive plan to assemble the first directory needs to be designed. Veritas AG, a Munich-based company, seems to have experience in the European markets in integrating wireless into directory assistance, using proprietary subscriber data funnels that

¹¹ *New England Economic Associates*, op.cit., p. 29, Table 4

¹² *Wireline Competition Bureau*, op.cit., p. 10-3

¹³ *New England Economic Associates*, op.cit., p. 33, footnote 75

¹⁴ *New England Economic Associates*, op.cit., p. 29

¹⁵ The lower limit represents a straight calculation from quantifiable providers, whereas the upper bound would encompasses all directory sources (CD-ROM, Presubscription, Web, etc.)

¹⁶ *Wireline Competition Bureau*, op.cit., p. 11-5, as cited from the CTIA, estimated 427 minutes per subscriber per month. (427 minutes x 140766842 subscribers x 12 months = Yearly calling x 0.5% = Increase)

¹⁷ In-Stat, as cited by *Wireless Review*, Nikki Swartz, April 15, 2001

channels many databases into one; additionally, the company's software employs verification methods to check for data integrity and address accuracy.¹⁸

CC Docket 99-273: The Provisioning of Direction Listing Information and Privacy Concerns

Three years after the passage of the Telecommunications Act of 1996, the Federal Communications Commission opened an inquiry into *The Provisioning of Directory Listing Information Under the Communications Act of 1934, as Amended*¹⁹. The nature of the directory assistance market and emerging ILEC competitors broadened the discussion into numbering topology or presubscription to 411. However, of the 329 filings in the matter, only a handful have requested that the Commission redress the issue of integrating wireless numbers – an issue that the Commission has been dodging categorically by considering wireless providers CMRS providers, and therefore not subject to the rules and regulations of local exchange carriers.

While the Commission has been sidestepping wireless directory assistance under the definition pretense, it seemingly conveniently and arbitrarily opened the scope for the limited purpose of number portability. The net effect of this regulatory approach is leaving wireless providers dangling somewhere between being subject to the rules and regulations of LECs and being a relatively unregulated market.

In the absence of regulation it is unlikely that competing carriers will voluntarily build a subscriber list for DA services, even with the assistance of the Cellular Telephone Internet Association (CTIA). In any event, there could be serious monopolistic consequences of building the directory without government intervention, as the information (which truly belongs to the public) would be tightly controlled by the wireless companies. Having a regulated system would also open the possibility that the directory could be used to provide emergency dispatchers with basic information about the caller – this provides the opportunity for the FCC to address multiple objectives in a single, comprehensive task.

One perceived limitation on introducing a wireless directory is the revenue model employed by US wireless carriers: receiving party pays. However, consumer behavior dictates the service offerings by carriers, and, it should be expected for carriers to provide additional airtime or altogether shift the billing model. Moreover, the exact extent of this concern is minimal: most people calling a wireless phone are calling with reason – from business to personal contacts it is rare that an unwanted call is received. In any case, the decision to take the call is voluntary, as telephones are equipped with caller identification, which provide the end user with the ability to not answer a call.

The FCC could conceivably mandate DA providers only provide a call completion and never provide the caller with the wireless telephone number. Employing such a model would avoid the existence of a master list of name and numbers, and therefore preclude marketers from making unsolicited telephone sales-calls. Additionally, such a model provides security to the firms that integrate the data, as the strict control is maintained over the delivery and development costs can easily be recovered. An investment of time, money, and resources will be needed to alleviate consumer fears and alter intrinsic

¹⁸ Varetis AG, Munich, Germany, <http://www.varetis.com>

¹⁹ CC Docket 99-273

behavior. False connections between integrating wireless numbers and receiving sales telephone calls are immediately triggered. Educating the consumer into the truth and purpose of the database needs to be a fundamental component of any program. Also, empirical data suggests that convincing the public that consumers are the ultimate benefactor of the service is going to be a difficult obstacle to overcome.

Conclusion

The Federal Communications Commission has a obligation to maintain a high quality telephone network in the United States and a duty to citizens and commerce to manage the telecom infrastructure. With clear evidence of distress in the directory assistance market segment and pressing need for a comprehensive directory of wireless and landline telephone numbers, the FCC needs to shift its policy to reflect not only a positive step for telephone consumers, but the telephone industry as well. Maintaining the integrity of the market dictates that the Commission intercedes to prevent the collusion between carriers and lock-out of competitive directory assistance providers. The worst industry scenario is a rat-race for a list of 150 million subscribers.